114·8 million bushels. This astonishing change is a remarkable achievement for which the Allies may well be grateful and of which America may justly be proud. The total production of food naturally did not increase to the same extent. The data are:—

Total Food Production in the United States: Metric Tons, Millions.

	Total food	Protein	Fat	Carbo-hydrates	Total Calories, million millions
Average for 7 years, 1911–18	90·2	4 1	5·7	16·3	137·2
,, ,, 3 pre-war years	85·6	3 8	15·5	15·3	129·3
,, ,, war period ...	93·7	4·2	5·9	17·1	143·0

Animals contributed 58 per cent. of the total food, 50 per cent. of the protein, and 83 per cent. of the fat.

The table further shows what a vast amount of food has to be grown in order to produce a sufficiency of nutrients; only 29 per cent. of the total tonnage of human food is net nutrients; the remainder is water, ash, and inedible refuse.

Comparing the annual increases in the production of food with the growth of the population, Prof. Pearl arrives at the comforting conclusion that the food supplies of the United States are increasing more rapidly than the population, so that there is "as yet no occasion for worry along Malthusian lines in this country so far as subsistence is concerned."

Study of the details of Prof. Pearl's tables brings out a number of points of importance to administrators. The very small part played and playable—by the so-called "home garden" movement is shown by the fact that the *total* vegetable production of farm and garden amounts to only 2 per cent. of the total Calorie production in human food, and of this 2 per cent. a large proportion is contributed by commercial concerns. Similarly, poultry contributes less than 2 per cent. of the Calories. Cows, pigs, and wheat are the great reservoirs, contributing together 62 per cent. of all the protein and carbohydrate used as human food, 69 per cent. of all the fat, and 65 per cent. of all the Calories. Obviously, if there is to be an increase in human food we must concentrate on these (and in England on the sheep as well), and not lose ourselves in less important items, although, on the other hand, we must not fail to develop even a 1 per cent. item.

The distribution of this enormous production is elaborately dealt with. The high-water mark of exports was reached in the year 1914–15; thereafter they fell, and in 1917–18 were down almost to pre-war level; but, of course, the exported food was all going to the Allies instead of being distributed over the world. The 1914–15 result is explained by supposing that all reserves were then cleared out—a process obviously possible once only. In spite of the high exports, more food remained in the United States than in the pre-war period, which may be connected with the larger and more prosperous domestic population.

Finally, a table is given showing the average daily consumption per "adult man." For convenience the British data are also given. The figures are as follows:—

	United States			United Kingdom	Physiologica minimum
	Corrected for waste Grams per day	Not corrected for waste Grams per day		Not corrected for waste Grams per day	Grams per day
Protein ...	114	120	...	113	100
Fat	127	169	...	130	100
Carbohydrate	433	541	...	571	500
Calories ...	3424	4288		4009	3400

The United Kingdom figures are taken from the Royal Society's Report (Cd. 8421), and show that we eat less than our cousins across the water, unless, indeed, we waste less.

E. J. RUSSELL.

Theory of Electric Cables.

The Theory of Electric Cables and Networks. By Dr. Alexander Russell. Second edition. Pp. x + 348. (London: Constable and Co., Ltd., 1920.) Price 24*s.* net.

DR. RUSSELL'S well-known book on the theory of electric cables and networks is one which should be increasingly studied as the complex networks, which are now required in connection with large power stations, are constructed. The book is already well known to electrical engineers. It lays down those fundamental principles on which all designs of cable networks must be built up. The kilowatt capacity of central stations for generating electrical energy is now three times as large as it was when the first edition of Dr. Russell's book was published, and the importance of economical design in cables and networks is much more clearly recognised than it was twelve years ago.

The chief difference between the first edition and the second is the introduction of new chapters on alternating current theory and systems of supply, and in the inclusion of numerical examples which will make the book more useful for beginners. Some further extensions of Kelvin's law have been made, and an account is given of recent developments in cable construction. The scope of the work is so well known that it is not necessary to review it in detail. It deals with the properties of conductors and of insulating materials, methods of testing them, and the economy of the

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various systems of supply. It includes a number of important theorems relating to distributing networks, with the measurement of their insulation resistances and with the determination of the positions of faults.

The subject of dielectric strength is one on which Dr. Russell is a well-known authority, and the chapter on this subject is exceedingly good; it includes a number of useful tables for sparking voltages in air. There is a chapter on the grading and the heating of cables, and another on electrical safety valves, the book concluding with a chapter on lightning conductors. If the theories here given and their practical application were more clearly understood by all central station men, there would be a considerable reduction in the weight of copper which is now laid down in cable systems. It is to be hoped that an increasing amount of consideration will be given to the design of cables and distribution networks, and for this purpose the new edition of Dr. Russell's book will be of great value.

The Carbon Compounds.

A Text-book of Organic Chemistry. By E. de Barry Barnett. Pp. xii+380. (London: J. and A. Churchill, 1920.) Price 15*s*. net.

SINCE almost all lecture courses on organic chemistry follow certain main lines, it is to be expected from financial reasons that new text-books on the subject will not diverge far from the older books in their general treatment of the material. All that can be expected from the authors is the infusion of fresh interest by a variation in the scope of the books and in the handling of details. This is to be regretted; but it is apparently almost inevitable.

Within these limitations Mr. Barnett has written an excellent book. It is clearly put, very well illustrated, furnished with formulæ much superior to those usually found in text-books, and in addition possesses certain features distinguishing it from the ordinary run of its class. The most original of these is the guide to the literature of organic chemistry which terminates the introduction, and this is supplemented by references to books at the end of those chapters where further information may be required. By these means the student will gain a truer perspective of the subject, and will not be inclined to assume that his text-book has made him a past-master in the field.

If there is any fault in the book, it lies in the fact that the author appears to over-estimate the mental quickness of the ordinary student. The theoretical side of the subject is dealt with as a whole at the beginning of the volume, and it seems probable that the book would gain considerably if this part of it were extended. Also, cross-references to this section in the body of the text would improve the work.

The commercial applications of organic chemistry are emphasised more frequently than in most text-books, and enough information is given about the heterocyclic section to enable the student to appreciate its importance from the point of view of naturally occurring materials. In a new edition some description of indicators other than phenolphthalein might be given, and possibly a brief reference to the flavones and anthocyanins included in the heterocyclic section.

The book is laudably free from errors, and no misprint in it is likely to give any trouble to a careful reader. The only important slip appears to be the erroneous formula for chloropicrin given on p. 150.

As a whole the book is marked by its fresh treatment of the material, and is to be welcomed. Its main drawback lies in its price.

A. W. S.

Our Bookshelf.

Anthropology and History: Being the Twenty-second Robert Boyle Lecture, delivered before the Oxford University Junior Scientific Club on June 9, 1920. By Dr. W. McDougall. Pp. 25. (London: Humphrey Milford; Oxford University Press, 1920.) Price 2*s*. net.

THE object of this instructive lecture is to illustrate the importance of the study of anthropology as an adjunct to the study of history. Anthropology is not exclusively concerned with the measuring of skulls, or with the study of primitive man, save for the sake of cultured man. Without it, it is impossible to understand the causes of the rise and fall of nations, to forecast their future, or to guide the statesman from the experience of the past. An alien culture can rarely be imposed upon a people by external power and authority. As examples of the effect of race upon culture, the lecturer points to the disappearance of Buddhism from India and its progress in Tibet and China; the relative distribution of the Roman Catholic and Protestant forms of Christianity in Europe; and the power of expansion as illustrated by the success of Great Britain and the failure of France to create a colonial empire. These last, capacity and incapacity, were evolved in the prehistoric period, because no adequate explanation of them in the historical period can be postulated, and similar diverse qualities are assigned by the earliest historians to the ancestral stocks of both peoples.

The races capable of producing and sustaining

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